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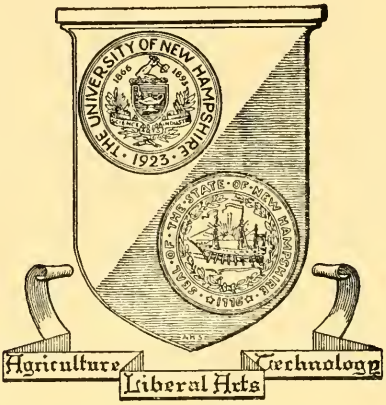

The University
of
New Hampshire

Bulletin 360 September, 1945

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION
Department of Agricultural and Biological
Chemistry

Inspection of Commercial Fertilizers

Made for the

STATE DEPARTMENT OF AGRICULTURE

T. O. SMITH and H. A. DAVIS

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

State Department of Agriculture

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Andrew L. Felker, Commissioner of Agriculture. The state inspectors, Mr. C. A. Lyon and Mr. F. H. Smart, collected samples of 40 brands of fertilizer and fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1945. The general character of the brands sampled is shown by the following classification:

Complete fertilizer	30
Phosphoric acid and potash	1
Superphosphate	2
Nitrate of soda	2
Muriate of potash	2
Ground bone	1
Natural manures	2

The Fertilizer Law

The purchaser of a fertilizer should familiarize himself with the full text of the fertilizer law. He should not accept from the dealer any bag of fertilizer which is not tagged and guaranteed in compliance with the law. The law governing these matters is as follows:

"Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package; the name, brand or trademark under which the fertilizer is sold; the name and address of the manufacturer or importer; the location of the factory; and a chemical analysis stating the minimum percentage of nitrogen, of available phosphoric acid and of water-soluble potash expressed in whole numbers.

"No fertilizer or fertilizer material containing the three essential fertilizing elements, nitrogen, phosphoric acid and potash may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section."

The state official charged with the enforcement of the fertilizer law is the Commissioner of Agriculture. Copies of the full text of the law may be obtained from his office in Concord. All inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office.

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against the misbranded products which doubtless would soon appear on the market if the sale of fertilizer was not under state regulation. The value of a fertilizer depends mainly upon its content of available plant food, particularly nitrogen, phosphoric acid, and potash. The presence of these constituents can

be determined only by a chemical analysis. To insure that they are being furnished by all manufacturers in the guaranteed amounts, it is considered necessary that each brand of fertilizer offered for sale be officially inspected and analyzed one or more times each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law in every respect will not only assist in the enforcement of the law but will at the same time insure himself the protection of the law. If the buyer fails to assure himself the legal requirements have been met, he accepts the fertilizer at his own risk.

Use of Commercial Fertilizers

This bulletin is concerned with the enforcement of the fertilizer law. It is not within its scope to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station are constantly testing soils and carrying out experimental work with various fertilizer materials on hay and crop land. The Department of Horticulture does considerable experimenting to determine the best fertilizer treatments for fruits and vgetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mailing Room, University of New Hampshire, Durham, New Hampshire.

Sta.	Cir.	47—Fertilizer Experiments with Sweet Clover. 12 pp.
Sta.	Cir.	50—Fertilizer Experiments with Hay Lands in the Connecticut Valley. 15 pp.
Sta.	Cir.	58—Fertilizer Needs of Alfalfa on New Hampshire Soils. 12 pp.
Sta.	Cir.	61—Fertility Needs of Dairy Farm Corps in the Connecticut Valley. 12 pp.
Sta.	Cir.	63—Fertilizers for Sweet Corn. 8 pp.
Ext.	Cir.	65—Worn-out Hay Lands. 4 pp.
Ext.	Cir.	147—Top-Dressing Hay Lands. 4 pp.
Ext.	Cir.	210—Purchasing Lime and Fertilizer. 12 pp.
Ext.	Cir.	248—Wartime Fertilizers. 4 pp.
Sta.	Bull.	306—Experiments with Grass Hay. 24 pp.
Sta.	Bull.	320—Pasture Top-Dressing in New Hampshire. 24 pp.
Sta.	Cir.	59—Effect of Soil Moisture and Fertilizer Placement on Vitality of the Potato Seed Piece. 11 pp.
Sta.	Bull.	326—Studies of Pasture Management. 24 pp.
Ext.	Bull.	59—The Apple Orchard in New Hampshire. 39 pp.
Ext.	Cir.	264—Red Raspberry Culture. 4 pp.
Ext.	Cir.	104—Blackberries for New Hampshire. 4 pp.
Ext.	Cir.	148—Improving the Home Orchard. 4 pp.
Ext.	Cir.	173—Grape Growing in New Hampshire. 11 pp.
Ext.	Cir.	211—Strawberry Culture. 4 pp.
Ext.	Cir.	215—Improved Blueberries. 12 pp.
Ext.	Bull.	65—Home Fruit Growing in New Hampshire. 16 pp.
Ext.	Cir.	266—Root Crops. 20 pp.
Ext.	Bull.	45—Potato Growing in New Hampshire. 32 pp.

Sta. Bull. 324—Experiment with Potatoes. 38 pp.
Ext. Cir. 99—Asparagus Culture. 4 pp.
Ext. Cir. 170—The Home Vegetable Garden. 20 pp.
Ext. Cir. 212—Cabbage. 4 pp.
Ext. Cir. 213—Squash. 4 pp.
Ext. Cir. 220—Tomatoes for Good Health. 8 pp.

While the word fertilizer does not appear in all the above titles, no publication is included which does not discuss some aspect of the use of fertilizer.

Conformity to Guarantee

The chemical analyses were made by the methods of the Association of Official Agricultural Chemists. Twenty-six of the 40 brands analyzed equaled or exceeded the manufacturer's guarantee. No brand failed to meet the guarantee in all of the three constituents, total nitrogen, available phosphoric acid, and water-soluble potash. Three brands were below guarantee in two of the three constituents, two in nitrogen and available phosphoric acid, and one in nitrogen and potash. Eleven brands failed to meet the guarantee in only one constituent.

Including all the brands referred to above, six brands were found to contain less than the guaranteed amount of nitrogen. The greatest deficiency was 0.96 per cent. The average of the other five deficiencies was 0.20 per cent. Nine brands failed to meet the guarantee in available phosphoric acid. One brand was deficient 0.64 per cent. The average of the other eight deficiencies was 0.37 per cent. Two brands contained less potash than was guaranteed. One, a muriate of potash, guaranteed 60.00 per cent, was deficient 1.60 per cent. The other deficiency was 0.36 per cent.

Four brands were guaranteed to contain magnesium oxide. All exceeded the guarantee.

In the tabulation of the analyses in the following pages deficiencies of one-fourth of one per cent or more are shown in italic type. The manufacturers are arranged alphabetically. The brand name is listed alphabetically or numerically by formula under the manufacturer.

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Allied Chemical and Dye Corp. New York, N. Y.										
Arcadian Nitrate of Soda	16.00	16.10	....	....	....	....	....	....	....	....
American Agricultural Chemical Co. North Weymouth, Mass.										
Agrico for New England 4-12-8	4.00	4.05	....	12.51	12.00	*11.72*	8.00	8.18	....	....
Agrico for New England 5-8-7	5.00	5.10	....	8.84	8.00	*7.67*	7.00	7.23	....	....
Agrico for Potatoes 5-10-10	5.00	4.85	....	11.43	10.00	10.85	10.00	*9.64*	....	....
Agrico Phosphate and Potash 0-14-14	....	....	....	15.22	14.00	14.69	14.00	15.44	....	....
Agrico Topdressing 7-7-7	7.00	7.05	....	8.17	7.00	7.67	7.00	7.24	....	....
Apothecaries Hall Co. Waterbury, Conn.										
Bone Meal	2.25	2.77	22.00	26.90	....	15.03	....	....	....	....
Liberty 5-8-7	5.00	5.21	....	9.15	8.00	8.53	7.00	7.93	....	....
Liberty 5-10-5	5.00	5.47	....	10.87	10.00	10.35	5.00	5.42	....	....
Liberty 5-10-10	5.00	5.29	....	10.98	10.00	10.24	10.00	10.79	....	....
Armour Fertilizer Works Carteret, N. J.										
Armour's 4-12-8	4.00	4.00	....	12.81	12.00	12.27	8.00	8.61	....	....
Armour's 5-10-10	5.00	5.08	....	11.28	10.00	10.42	10.00	10.15	....	....
Armour's 7-7-7	7.00	7.10	....	7.12	7.00	*6.71*	7.00	7.39	....	....
Armour's 8-16-16	8.00	8.07	....	16.70	16.00	16.36	16.00	16.03	....	....
Armour's Big Crop 5-8-7	5.00	*4.68*	....	8.64	8.00	8.01	7.00	8.75	....	....
Armour's Superphosphate 20%	....	....	....	21.32	20.00	20.67	....	....	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Buell Fertilizer Co. **Exeter, N. H.**										
Buell Peat-Poultry Manure	3.00	3.23	....	2.84	3.00	*2.60*	1.50	1.73	....	....
Chilean Nitrate Sales Corp. **New York, N. Y.**										
Champion Nitrate of Soda	16.00	16.05	....	....	....	....	....	....	....	....
Consolidated Rendering Co. **Boston, Mass.**										
Corenco 5-10-10 Peerless Potato	5.00	5.10	....	11.34	10.00	*9.56*	10.00	10.60	....	....
Corenco 5-8-7 Potato and General Crop	5.00	5.31	....	9.23	8.00	8.31	7.00	7.52	....	....
Corenco Victory Garden Fertilizer	5.00	4.92	....	10.79	10.00	10.19	5.00	5.49	....	....
Merrimack 4-12-4	4.00	4.22	....	13.07	12.00	12.29	4.00	4.49	....	....
Merrimack 5-8-7	5.00	5.08	....	8.88	8.00	8.46	7.00	7.05	....	....
Merrimack 5-10-10	5.00	5.22	....	11.03	10.00	10.51	10.00	10.29	....	....
Eastern States Farmers' Exchange **West Springfield, Mass.**										
Victory Garden Fertilizer 5-10-5	5.00	5.12	....	10.68	10.00	10.15	5.00	6.09	2.00	3.62
International Minerals and Chemical Corp. **Woburn, Mass.**										
International 4-12-4	4.00	4.34	....	12.48	12.00	12.02	4.00	4.01	....	....
International 5-10-5	5.00	5.01	....	11.41	10.00	10.81	5.00	5.05	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
International 5-10-10	5.00	5.12	....	10.86	10.00	10.28	10.00	10.65	....	....
International 7-7-7	7.00	7.01	....	7.44	7.00	7.20	7.00	7.41	....	....
International 8-16-16-1½	8.00	8.02	....	16.51	16.00	16.08	16.00	16.36	1.50	2.14
International Caribee 5-10-10-2	5.00	5.15	....	10.33	10.00	*9.72*	10.00	11.12	2.00	3.41
International Muriate of Potash 60%	....	....	....	....	....	....	60.00	60.63	....	....
International Potato 5-10-10-2	5.00	5.00	....	10.73	10.00	10.47	10.00	10.45	2.00	2.76
International Superphosphate 20	....	....	....	20.13	20.00	*19.36*	....	....	....	....
Harold L. Norwood North Reading, Mass.										
Norwood Sheep Manure	1.83	*1.48*	....	0.35	0.89	*0.29*	1.03	2.90	....	....
Rogers & Hubbard Co. Portland, Conn.										
Muriate of Potash 60%	....	....	....	....	....	....	60.00	*58.40*	....	....
Red H 5-8-7	5.00	5.38	....	8.62	8.00	8.02	7.00	7.21	....	....
Red H 5-10-10	5.00	5.08	....	10.53	10.00	10.01	10.00	10.69	....	....
Red H 8-16-16	8.00	*7.01*	....	16.28	16.00	16.18	16.00	17.83	....	....
Swift & Co. Fertilizer Works Baltimore, Maryland										
Victory Garden Vigoro	5.00	4.89	....	10.01	10.00	*9.62*	5.00	5.30	....	....